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Editorials.

THE VETERINARY SURGEONS' ACT (1881) AMENDMENT BILL.

If the misguided opposition and misstatements of our opponents n connection with the above Bill have done nothing else, they have at least shown us where our friends are to be found, and the Bill, having passed its Third Reading, is a great step forward.

The matter of the constitution of the profession has certainly been well ventilated, and those of our readers who are interested should get a copy of the Parliamentary Debate which took place on the 11th inst.*

The Bill asks for no further powers, and the matter of taxing ourselves is quite our own affair. Without money we can do nothing, and in this we do not differ from other Corporate Bodies. There is no profession which has been more self-supporting than ours—too much so, perhaps, in the past. As Captain Elliott, M.P., stated in the House: "In this measure the Veterinary Surgeons are asking permission to tax themselves, and the fact that they are willing to do this in order to extend and enlarge the field of knowledge on these matters is one of the most admirable elements of public spirit that this House has recently seen." The Parliamentary Secretary of the Ministry of Agriculture (Sir A. Boscawen, M.P.) gave it his emphatic blessing in the words, when speaking on the subject of the Bill, "not only have we no objection to it, but we very much hope it will pass into law"; whilst the lucid explanations of several dis-

* Obtained from H. M. Stationery Office, Imperial House, Kingsway, London, W.C.2. Price 3d.

puted points by Mr. Cautley, M.P., would almost entitle one to think that his name was already on the Register of the Royal College of Veterinary Surgeons, so perfect was his knowledge and so accurate his description of the academic status of the teaching and the examining bodies. The profession is grateful to the Members of the House of Commons who have given the Bill their support, whether actively or only by their votes, for to our future the success of the Bill means a lot, but to the Agricultural Community it means much more.

THE TREATMENT OF MAMMITIS IN COWS.

THE treatment of inflammatory diseases of the udder which affect the composition and secretion of milk has long been in an unsatisfactory condition. External applications, fomentations and febrifuges have little effect in remedying a diseased or defective condition arising in connection with the physiological action of milk secretion or to some pathological condition inside the udder itself. A good deal of investigation has apparently been carried out with a view to ascertaining what medicinal remedies given by the mouth appear in the milk when drawn from the udder. We know for instance that iodine, salts of lead and copper, aloes, senna, rhubarb, croton, boracic and salicylic acid, etc., when given are eliminated in some degree by the milk and chloroform and ether may be found in it after anæsthesia. The object of these investigations chiefly appears to have been to draw up a list of drugs that veterinary surgeons should not give to milch cows when treating their diseases.

Until quite recently it never seems to have struck anybody that the very fact that medicinal agents given may be secreted in the milk is an important therapeutical fact to be made use of in the treatment of diseases of the udder, bringing about bad milk. In a recent number of *The Journal of the American Veterinary Medical Association*, Professor J. N. Frost, Cornell University Veterinary School, U.S.A., gives an interesting and practical account of the uses of formalin (liquor formaldehydi) in the treatment of 5 cases of mastitis. His article was reproduced on pages 115, 116, 117, 118 of THE VETERINARY JOURNAL for March, 1920, and will well repay perusal by all veterinary surgeons interested in the subject. Most of us know the good effect of a constant stream of a suitable antiseptic on an unhealthy wound or dirty abcess cavity, and where the same effect can be produced in a living gland which is naturally endeavouring to throw off and eliminate a diseased secretion the use of the antiseptic stream seems to be very sound theoretically. Practically, too, we think Professor Frost has done good service and we hope that our readers, and especially country practitioners, will give us their experiences in the use of forma-

lin in the treatment of mammitis. Most of the cases we have to treat (apart from tuberculosis) are those of streptococcic mammitis. The milk is discoloured with the blood, or is yellow, and has yellow or yellowish brown flakes in it suspended in a watery fluid (serum or plasma), or when allowed to stand for several hours a white, yellowish white or yellowish sediment settles to the bottom, or the milk may be grayish and watery.

On May 20 we were called to see a black and white cross-bred cow, 8 years old, suffering from mammitis in both fore quarters of the udder. The milk was reddish-brown, flocculent and smelt badly. We prescribed ½ ounce doses of formalin night and morning in a full quart of cold water. At the same time the bag was rubbed with an emollient liniment (rape oil, water, pot. carb. and liquor plumbi. subacet.). After 8 days' treatment, the owner reported the cow milking well and normally. The only precaution that seemed necessary was to impress on the attendant the importance of giving the drug in a *full quart* of water, and in order that no mistake could be made we supplied him with a quart bottle.

In one or two of Professor Frost's cases ½ ounce doses of formalin were followed by one drachm doses 3 times daily. In order to produce the good effect of the formalin treatment it does not seem necessary to give one ounce doses of the drug twice daily, as recommended on page 118 of the *V.J.*, March, 1920. Economy in drugs is important at present, and when a cow has been on grass, a preliminary dose of salts is not necessary. We think that formalin might be used to remedy defects in milk (of colour and taste) not due to mammitis.

Original Communications.

A CASE SHOWING THE IMPORTANCE OF THOROUGH DISINFECTION.

By W. T. HEWETSON, M.R.C.V.S.,
Brampton, Cumberland.

In November last I was asked to accompany Mr. Barrow, M.R.C.V.S., Ireby, Cumberland, to see some cattle about a year old, which were affected with head trouble. In the first instance, the owner noticed that one of his cattle did not seem quite well. He did not consider it ailed much, but it looked somewhat stupid, and did not appear to be grazing like the rest. So he decided to drive it home. The animal seemed to be ailing so little when driven that the owner almost changed his mind, but he remembered that cattle ailing on grass were often worse than they appeared to be. So the animal was driven home, and a dose of laxative medicine administered. The next morning it was found lying on its side and unable to rise,

at times struggling and fighting with all four legs. It appeared to be in such a hopeless condition that it was decided to put it out of pain. This was done by striking it a blow on the head. The following day two more cattle were found to be ailing in a similar way. Mr. Barrow was called in, and as the first case was not buried, he made a post-mortem, and found the remains of a burst cyst on the brain, yet there were no distinct symptoms of sturdy in the two other cattle ailing. They did not turn round, nor could any softening of the frontal bones be felt on manipulation. One animal, when inside, kept boring his head against the wall, and when outside he would rush through the fences. The other only appeared dull and stupid. The breathing was not affected unless the animals were excited. The appetite, though impaired, was not quite lost.

When I visited the farm with Mr. Barrow, there were four cattle ailing. One carried its head in the normal position, but persisted in walking from one end of the shed to the other, and this it continued to do for a number of times. One animal held its head slightly to one side, and appeared to be partially blind in one eye. Another was only slightly affected in the head. The fourth animal was lying on its side, unable to rise, and occasionally struggling as if in pain. From these symptoms we concluded that the animals were suffering from sturdy, or otherwise they were suffering from the effects of a poison generated in the digestive organs, probably from eating fallen leaves. It is not unusual to have three or four animals affected at the same time, on the same farm, and showing symptoms of stomach staggers, as it is commonly called, but it is very unusual to have five cattle at the same place and at the same time suffering from sturdy.

The owner had bred and reared nineteen calves during the previous autumn and early spring. All the calves had been reared under the same conditions, and all had been free from disease of any kind up to the present. After hearing what the owner had to say, we came to the conclusion that the animals were suffering from stomach trouble. As one of the steers was unable to rise, and had not taken any food for a day or two, we obtained consent to kill it and make a post-mortem. So the animal was bled. The internal organs and bowel contents were carefully examined. All the internal organs were healthy, nor could we find anything in the appearance or in the contents of the stomachs and bowels that could cause the symptoms manifest. The brain alone remained to be examined. We carefully removed the frontal part of the skull, and lying on the front of the brain we found a large cyst (*cænurus cerebralis*), thus proving we had made a wrong diagnosis. Instead of killing the animal, it would have been better if we had operated for sturdy first, and in this case from the position of the cyst, I am sure we would have punctured it,

and the animal might have been saved. In explaining to the owner that the cause of sturdy was due to cattle swallowing segments of the tape-worm passed by the dog, we learned that all these calves had been reared in a stable which was not used for horses, but during the summer months five dogs were kept in it. The calves were put in this stable at birth, but the place had been previously cleaned and disinfected with lime and dipping, we were told. The owner, on being asked if all the woodwork had been cleaned and disinfected, replied that only the walls and floors had been. Seeing the three ailing cattle were in very good condition, it was thought advisable to send them to the slaughter-house to be slaughtered. Of the nineteen steers that were thus reared, eight of them became affected with sturdy.

CUCUMIS MYRIOCARPUS (WILD MELON VINE) AS A CAUSE OF IMPACTION OF THE COLON IN NEW SOUTH WALES.

By MAX HENRY, B.V.Sc., M.R.C.V.S.,
Sydney, New South Wales.
AND H. BELSCHNER
(*Third Year Student, Sydney University Veterinary School*).

THERE grows very plentifully throughout the greater part of the western districts of New South Wales a member of the family *Cucurbitaceæ*, introduced originally from South Africa, and known locally as the wild or paddy melon. It has been identified by the Government Botanist, Mr. J. H. Maiden, F.L.S., as *Cucumis myriocarpus* (*Naud*).

The plant grows much like any melon or pumpkin vine, sending out long trailing stems, bearing small yellow flowers, and then numerous small melons about three-quarters to one inch in diameter—much like a miniature water melon in appearance, but prickly. They are at first greenish, but turn yellow as they ripen, and are much appreciated by stock in dry times for the moisture they contain. The melons themselves have frequently been accused of causing amaurosis from degeneration of the optic nerve in horses, but so far experimental work has failed to substantiate this.

The plant has very considerable drought-resisting powers, and is frequently the only green thing to be seen in the paddocks. While young it is fairly succulent and comparatively harmless, but when old and commencing to die off the long trailing stems and the leaf stalks are extremely fibrous, and show a very marked tendency to ball in the stomach and intestines, especially when melon forms the greater part or almost all the diet of the animals. Frequent reports have been received of horses dying from eating melon, and in some instances the post-mortem appearances described pointed to impaction of the colon as the cause of death.

Although cursed by horse-owners, the plant is not without its supporters, as during droughty periods, such as are now being experienced, it provides excellent feed for sheep and cattle, which do not appear to suffer from its effects owing, probably, to the remastication. It has, on at least one occasion, been made into silage and fed later with success.

Recently opportunity was afforded the writers of observing several cases where the cause and course of the affection could be clearly followed, and curative treatment adopted. The animals affected were young well-bred draught mares in very fair condition, who were at the time in a paddock containing a large quantity of melon, although they had only recently been brought in. The paddock in which they had previously been running had contained some melon, but not a great quantity. The writers are thus unable altogether to agree with Stock Inspector Little, who, writing in the *Agricultural Gazette* of New South Wales for August, 1915, states that " horses running constantly on melon seldom suffer, when they do it is generally the old animals or those with defective teeth."

There had been on the farm in question rather heavy mortality, which so far had not been satisfactorily explained, and as the country had once had a bad reputation for anthrax, the solution of the question was of some importance. The first case seen was as follows :—

The mare was turned into the melon paddock on Sunday morning, and was then apparently in good health. She was not again seen until midday on Monday, when she was found dead, although the carcase was still warm. There was no discharge from the natural orifices, nor was the body excessively distended with gas. No injury or wound was noticed, except a small fistula of the wither. The subcutaneous tissues were normal, but the blood had not coagulated well and was dark in colour and somewhat sticky. The stomach was filled with water, and was normal save for two spiropteral tumours, each about one inch in diameter. The small intestine was almost empty, and was patchily congested—caecum normal—large colon very full of a mass of fibrous material mostly composed of the remains of the paddy melon ; a few inches from ileo-caecal valve was a hard, rounded mass about nine by six inches of the same material. The small colon contained, about a foot from its commencement, a larger mass, very firm, and taking the impress of the colon. Where these masses occurred the intestine was markedly congested. Strongyles were present in fair numbers. There were signs of struggling visible on the ground. The feed in the paddock contained a great deal of melon, and the mare had evidently done her best to fill herself with it, both in this and in her last paddock. It is often said, and with some justification, that

certain animals develop a liking for the plant to a greater extent than others, and will even leave fair feed to eat them.

Although the cause of death was fairly obvious, yet, owing to the previous history of the place, it was thought as well to submit smears and an ear to the Veterinary Pathologist (Dr. S. Dodd, D.V.Sc., M.R.C.V.S.), who reported that no pathogenic organisms were present. A few days later a second animal was found dead, and on post-mortem examination revealed a practically identical picture. Whilst the post-mortem on this animal was being carried out it was noticed that two more animals were down and in pain. They were immediately removed to the stables and drenched with Ol. lini, 1 pint, Ol. menth Pip, 1 drm., Spts. Ammon. arom, 1 oz. After backraking, copious enemata of cold water were administered with the garden hose, and as a result in one case a hard, elongated mass of vine, weighing 3½ lbs., was passed, and almost immediate relief given to the animal.

In the other case relief had not occurred that night, so 1 oz. Chloral was given, and next morning a further half pint Ol. lini and copious enemata. As a result, two large masses similar to that removed from the previous case were passed. Both animals then made an uninterrupted recovery, and the remainder of the horses were removed from the paddock.

The cases are of interest not from the point of view of treatment, which merely follows routine lines, but because one particular article of food can be with certainty accused of being the direct cause of the impaction and mortality, and such knowledge is of considerable value to veterinarians called on to investigate mortality from unexplained causes in the back country of Australia.

A NOTE ON A TYPE OF MARASMUS AMONGST HORSES IN INDIA.

By CAPT. J. R. HODGKINS, D.S.O., F.R.C.V.S.,
Royal Army Veterinary Corps.
(*Secunderabad, India*).

There exists in India a disease of horses which causes chronic debility and emaciation. As the result of careful post-mortem examinations and the elimination of other probable causes by blood examinations, malleinisation, etc., one is forced to the conclusion that the debility is the result of chronic gastritis.

The factors causing the gastritis are nematode worms, *spiropteres*, or, as they are more correctly designated, *habronemæ*. There are three *habronemæ* found in the stomachs of equines, viz.:

Habronema megastoma (Rulodphi).
,, *microstoma* (Schneider).
,, *muscæ* (Carter).

The first of these nematodes is found in sub-mucous abscesses in the stomach of equines, while the other two species are found lying free on the mucous surface of the stomach.

The life histories of all these parasites have been worked out, the first being the work of Ransom on *H. Muscæ*. Working on the same lines Hill has worked on the cycle of the other two species.

It may be stated briefly that according to Ransom the life cycle of *H. muscæ* is completed in the common house-fly, *Musca domestica*, and that Hill found that the life cycle of *H. megastoma* was also completed in *Musca domestica*, whilst that of *H. microstoma* had for its intermediate host *Stomoxys calcitrans*.

The prevention of infestation by these nematodes depends on the destruction of flies.

Fly breeding takes place in freshly-deposited horse manure, so that early removal of this material from the vicinity of lines is indicated.

The spraying of dung pits is essential. *H. megastoma* is inaccessible to medication by way of the mouth.

H. microstoma and *H. muscæ* lie in the " glue-like " layer of mucous on the villous portion of the stomach.

At post-mortem examination the two nematodes that live superficially are seen to be moving in myriads on the internal lining of the stomach and they are not easily removed. Merely washing the surface will not dislodge them, they require to be scraped away. This, of course, is because of the thick tenacious mucous in which they live.

The disease apparently does not yield to treatment by way of the mouth, and intra-venous infections of tartar emetic have had no effect on cases under observation.

The damage done by these parasites is very considerable, as the following accounts of post-mortem examinations will show.

CASE I.—*Subject:* Bay gelding, age 7 8/12 ; Australian.

History: Admitted with lymphangitis, very debilitated. Usual treatment for lymphangitis.

Malleined—negative.

Blood smears—negative.

The lymphangitis quickly cleared up, but no treatment improved the debility.

He was destroyed.

Post-mortem Examination.—Carcase was very poor in fat. There was a sub-mucous abscess in the stomach as large as a coconut.

The cardiac mucosa was chronically inflamed and thickened. The abscess contained a cheesy stinking mass of inspissated pus and nests of *H. megastoma*. The pylorus was covered with nematodes.

CASE 2.—Bay gelding, thirteen years, Australian ; admitted with debility. Has entries for debility ;

1916 = 30 days.
1917 = 72 ,,
1918 = 9 ,,
1919 = 40 ,,
151 days.

Destroyed 11—19.

Post-mortem Examination.—Carcase deficient in fat. There was a sub-mucous abscess as large as an orange. The stinking pus of the interior was alive with *H. megastoma.*

CASE 3.—Bay mare, aged 8 ; Australian.

History : Diarrhœa on 9-11-19, very debilitated, grew worse and became emaciated. Went off feed and was so weak on 22-11-19, that she was destroyed.

Post-mortem Examination.—Carcase emaciated ; stomach the subject of a chronic gastritis. Many sub-mucous abscesses containing *H. megastoma.* Local peritonitis was present above the area of attachment of spleen. Spleen very enlarged and undergoing a generalised suppurative inflammation. Abscesses in the mesenteric glands.

CASES 4, 5 and 6.—Were all debilitated 95 days, 50 days, 73 days, under treatment respectively. Malleined and blood smears taken with negative results.

Post-mortem Examination showed chronic gastritis, the presence of submucous abscesses with nematode worms and stinking pus. The *habronemæ* on the inner surface of the stomach seemed to exist in myriads. All other organs were apparently normal.

CASE 7.—Bay mare, 9 years ; under treatment for debility, 66 days. Mallein test and blood tests negative. Destroyed.

Post-mortem Examination.—Chronic gastritis ; a large flat abscess with fibrous walls, 5″ × 4″, containing pus smelling foully and an orange-sized abscess were present in the sub-mucosa. Vast numbers of *habronemæ* on the mucous surface of the stomach. Carcase poor. Organs, other than the stomach, normal.

CASE 8.—Bay mare, 10 years. Under treatment 85 days with debility.

Post-mortem findings exactly as in previous case.

CASE 9.—Bay Australian gelding, aged 9 ; came into hospital on 1st of month with colic. He was debilitated. He was treated for colic and appeared well on the 3rd. On the 13th he was again colicky, very anæmic and depressed, with sunken eyes and totally off his feed. He died on the 14th.

Post-mortem Examination.—On opening the carcase a large quantity of pus was found lying in the abdominal cavity. There was an extensive inflammation of the peritoneum. At the apex of the spleen was an evacuated abscess cavity. On opening the stomach a large sub-mucous abscess corresponding in position with the abscess situated on the external surface and involving the spleen was found. This abscess was due to *H. megastoma*. A second sub-mucous abscess was present.

The surface of these abscesses as the result of gastritis is best likened to an uterine cotyledon of a cow. There was an extensive chronic gastritis and *habronemæ* were present on the mucous surface.

The abscess in the splenic area (and the subsequent peritonitis) was probably due to bacterial invasion from the suppurative processes in the gastric mucosa. Compare Case No. 3 with this one.

CASE 10.—An eight-year old Australian gelding came under notice in October, 1919, very debilitated, malleined and blood smears examined. Negative results in both tests. He had a dental irregularity that was easily corrected.

A course of treatment for debility and internal parasites was followed out for two months. At the end of this period he had not made the slightest progress. He was kept under observation until March 20 and then destroyed.

Post-mortem Examination.—The stomach was the subject of chronic gastritis. There was a patch of ulceration 3″ × 2½″ situated in the pyloras. The pyloric extremity of the stomach was very much thickened and hard to the touch. One sub-mucous abscess was present, containing *H. megastoma*. There were vast numbers of *habronemæ* in the mucous surface. A very careful examination revealed no further abnormalities.

A CONTAGIOUS IMPETIGO OF CATTLE.

By H. E. HORNBY, M.R.C.V.S., D.V.S.
(*Northern Rhodesia.*)

Next to trypanosomiasis, skin-diseases are the chief sources of loss to European cattle-owners in the Fort Jameson district of Northern Rhodesia. The worst of these is demodectic mange, but running it close for destructiveness is the subject of this article. Other forms of skin-disease affecting cattle of Northern Rhodesia are psoroptic mange, eczema and a dermatitis of white-skinned animals which is probably due to the action of strong sunlight on sensitised, unpigmented skin.

The greater part of my knowledge of the etiology of this contagious impetigo is founded on an authoritative article by R. van Saceghem

(1915). What is apparently the same disease has been alluded to by Armfield (1916), Curson (1919) and Hutchins (1919). My chief, Mr. Lane, dealt with it in a circular letter in 1915.

Distribution.—The disease occurs throughout Central Africa. Lane records its presence in N.W. Rhodesia under the name of "Senkobo Skin-Disease." Curson speaks of it under its local native name of "Saria," as occurring in the New Langenburg district of Tanganyika Concession. My friend, Mr. F. J. McCall, tells me that it exists in British East Africa, and I have it in on the authority of Dr. Van Raes, of Elizabethville, that it exists in Egypt as well as in the Congo. Hutchins records the infection of a dairy herd in Kampala, Uganda, by a streptothrix, and he describes symptons and lesions which make me think that he refers to this disease. I have met with cases in Northern Rhodesia, Nyasaland, Portuguese East Africa and Tanganyika Concession (formerly German East Africa). Its distribution recalls that of demodectic mange, for, like that disease, it is apparently unknown to stock-owners south of the Zambesi.

Animals Affected.—Lane has known an eland to contract the disease, and I remember seeing lesions on a horse's legs and sheath which strongly resembled those of contagious impetigo; nevertheless, it is only as a cattle disease that the condition is well-known. It is enzootic throughout Central Africa, and one often sees native cattle slightly affected. European cattle and their grade progeny are far more susceptible to the disease than are native cattle, and among them the disease may assume epizootic form. Animals of all ages are attacked, and fat ones are as readily affected as thin.

Symptoms and Lesions.—The disease is essentially a seasonal one. It is from the commencement of the rainy season that fresh cases become apparent, for after the termination of the rains the disease assumes a chronic form in survivors, and fresh cases do not occur. The lesions may occur on any part of the body, but as a rule they are first noticed on the back, and in the beginning they consist of nothing more than "paintbrushes" formed by the matting together of a few hairs. Later on one notices little elevations on the skin and, as the disease advances, these grow and become confluent until they form bare, wart-like scabs through which stick a few hairs. Scraping or traction easily raises such a scab, which is then seen to be a crust composed of hairs, epidermal cells and coagulated exudate, leaving exposed a moist, pinkish surface, slightly hirsute and which may bleed a little. Very rarely is there an appreciable amount of pus formed. The lesions may be confined to the back of an animal and, in a native beast, may remain inconsiderable or even disappear spontaneously; that is, native cattle are essentially immune to the

disease. If the disease makes its appearance on a susceptible animal immediately before the cessation of the rains it, too, may remain in the form of localised lesions, but such a susceptible subject would

FIG. 1.—Generalised Contagious Impetigo, as seen during the dry season.

allow the disease to progress very rapidly under the favourable conditions of the rainy season. Commencing on the back the lesions would spread to the sides, perinaeum, axillae, udder or scrotum, belly, thighs, shanks, neck and head, in more or less the order mentioned. As the disease progresses the formerly discrete patches become confluent. Although the animal may be fat at the commencement, it always loses condition as the disease becomes generalised, and eventually it dies in marasmus.

Lane, in his description of the disease, says that the lesions may take two forms; one similar to those described above; the other characterised by small lumps *under* the skin, followed later by the wart-like growths. I think it probable that these latter cases are ones of mixed infection by the impetigo parasite and demodectic acari, a matter of frequent occurrence.

Van Saceghem considers that from the clinical point of view the disease may be localised or generalised. In the case of non-generalisation the malady may be limited to small lesions which may pass unnoticed but yet suffice to perpetuate the disease in a herd.

Etiology.—I have not had time to study this carefully, but very early in my researches a large series of negative findings, when fresh or macerated crusts and scrapings were examined in an unstained condition, convinced me that the disease was not an acariasis. Shortly

afterwards I became aware of van Saceghem's researches and I have not had difficulty in finding the parasite in stained preparations.

Both Lane and Armfield make tentative suggestions that the disease may be due to a virus carried by bont ticks, and the former, moreover, suggests that streptococci may be the causal organisms. It is probable that what Lane thought were streptococci were really spores of the causal fungus. The theory that bont ticks account for the spread of the disease is difficult to reconcile with the relative positions occupied on the body by these ticks and many of the lesions, unless one postulates, as does Armfield, that the arthropods introduce the virus into the blood.

F. J. McCall told me that he had found a streptothrix to be constantly present in the lesions, and Hutchins blames a parasite of the same nature. I am not in a position to state whether the organism constantly associated with the lesions can be correctly described as a "streptothrix," but the researches of van Saceghem seem to point conclusively to its fungoid nature.

The specific fungus is not detectable in the fresh state ; it is necessary to make a stained preparation and to examine it with an immersion

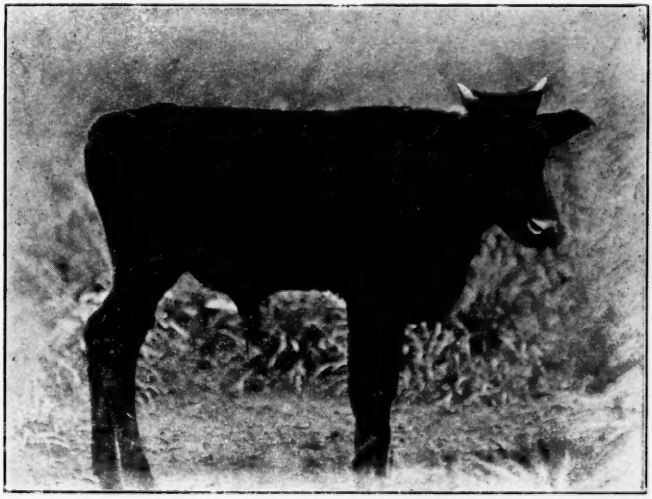


FIG. 2.—Generalised Contagious Impetigo, as seen during the wet season.

lens. One can make a smear with the serous exudate that is found under the crusts, or, more simply, one can make a microscopical preparation from crusts that have been teased up after a few minutes'

immersion in physiological serum. The stains recommended are dilute fuchsin, methylene blue, gentian violet, Borrel blue and Giemsa. For a description of the parasite I will quote the Belgian authority's own words :—

" On observe des filaments mycéliens plus ou moins abondants, parfois contournés, rarement ramifiés, irrégulièrement segmentés, entourés d'une membrane non colorée. Ces filaments ont une épaisseur de 1.4m a 1.8m et une longueur qui peut atteindre 1 mm. Ces filaments sont bourrés de spores rangées verticalement suivant la longueur, par trois, par quartre ou en amas. Dans la préparation, on observe parfois des amas de spores isolées qui simulent des cocci. La spore unique se multiplie et donne naissance à une rangée de spores qui se divisent pendant quelque temps dans le môme sens ; à un moment donné, les spores se divisent dans les deux sens, d'abord une fois, puis deux fois."

The author just quoted claims to have established that the parasite he describes is the true cause of the disease, and he named it *dermatophilus congolensis*. The fungus does not grow deeply into the skin, and, in the crusts, the hair is never attacked.

Why the disease only assumes a grave character during the rains is because it is only at this period of the year that the fungus finds the conditions of humidity and warmth necessary for its growth. Its greater exposure to rain and dew make the back a predilection seat of the parasite. Sucking calves frequently develop lesions around those parts of the muzzle which are regularly moistened with milk.

The spread of the disease over the body is determined by the existence of the necessary moisture, which may be derived from rain and dew, or may be in the form of serum compressed from clots due to injuries of any nature. It is probably owing to tick-bites that the axillae and perinaeum are so frequently affected. Other causes of spread of the disease over the body are rubbing, contaminated litter, tail-switching, defaecation, urination, etc.

Propagation from beast to beast takes place through the medium of infected rubbing places, contaminated litter or trek-gear. Possibly, also, through the agency of whips and flies.

Diagnosis.—After very little experience the disease can be recognised by simple inspection, because the scab formation is very characteristic if not actually pathognomonic. To demonstrate the parasite I pull off a crust and, with a clean knife, scrape the exposed raw surface. With the sanguinous matter so collected I make a somewhat thick smear. After fixation by heat I stain the preparation with alkaline methylene blue. It is on the thicker parts of the pre-

paration that one finds masses of the parasite ; among the scattered cells of the thin parts one finds only small pieces of broken mycelium. What is seen corresponds closely with what I have described above, the only point on which I am at issue with van Saceghem is in connection with the thickness being not greater than 1.8m. I have not been able to measure them but some filaments certainly appear to be bigger than that. Extraneous bacteria are surprisingly rare in these smears.

Prophylaxis.—This is deduced easily from a knowledge of the etiology. It is very difficult to guard against the introduction of the disease, on account of the impossibility of detecting minute lesions on an immune beast. Any visibly affected animal should be isolated and a policy of perfection would not allow a return to the herd of a cured beast. Regular dipping in arsenical fluid is claimed by some to act as a preventive, but a number of Southern Rhodesian oxen brought to Fort Jameson last year contracted the disease through intermediate infection, in spite of regular fortnightly dippings in full strength arsenical fluid.

Treatment.—Lane claims that regular dipping in full-strength Cooper's dip will cure mild cases. For more advanced cases he recommends a lime and sulphur bath. Van Saceghem lays emphasis, on the fact that if possible treated animals should be kept *dry*. In his opinion the lesions should not be washed or subjected to friction, as he considers that these manipulations only irritate the skin and serve to spread the lesions. He states that he caused generalisation of previously localised lesions by friction with arsenite of soda solution. He recommends cauterising local lesions with fire, after carefully picking off the crusts. His best results in the treatment of generalised cases followed the application without friction of carbolised pomade (1-10), dressing only a quarter of the body surface at one time.

M. Piot Bey recommends washing with soap, raising the crusts and then painting the affected surface with a 1 per cent. picric acid solution.

My own experience of arsenical dip as a curative agent has not been happy, nor was I very successful with a dressing of paraffin, sulphur and lard. I agree with van Saceghem that a therapeutic agent which fails to kill the parasite may serve to spread the disease. What he did with sodium arsenite solution I did with a weak carbolic one. It is useless to attempt to cure the disease with disinfectants of ordinary wound-lotion strength ; for instance, mercury perchloride is only useful when employed in the strength of 1-200.

I use Cooper's milk oil fluid, *not weaker than* 1-30. Correspondingly strong emulsions of similar proprietary drugs, as Hycol, Izal, Jeye's fluid, etc., are likewise useful. When treating a solitary lesion, I pick off the crust and apply the undiluted milk oil fluid. When lesions are localised I use it in the strength of 1-10 or 1-20. When the disease is generalised so that the whole body must be dressed I use it in the strength of 1-30, but I dress only from a quarter to half of a beast's body at one time, according to the extent of raw surface exposed by removing the scabs. By this means all but the worst cases can be cured, especially if, a fortnight after the first dressing, all unhealed lesions receive a second and stronger application of the medicament.

CASTRATION OF BOVINE MALES.

By D. S. LAUD, G.B.V.C.,
Veterinary Inspector, Municipal Health Department, Bombay.

UNDER the heading of "Castration of Bovine Males," I read an article in the VETERINARY JOURNAL of November, 1919, and it prompts me to record cases of castration, and the method adopted in case of three municipal bulls of Health Department Stables, C. Ward, Bombay Municipality, that were getting very mischievous, and the scavengering cart drivers could not control them.

Case No. 1.—Horn No. 11, Brand No. 1919, colour white; height 12-2", "Khillari Breed," age 5 years.

Case No. 2.—Horn No. 12, Brand No. 1910, colour white; height 12-2", "Khillari Breed," age 6 years (pair of the first).

Case No. 3.—Horn No. 5, Brand No. 1919; colour white; height 12-2½", "Deccani Breed," age 6 years.

The animals were prepared the previous day and were castrated on January 26, 1920. Castration clamps, scissors, and knife were placed in a bucket containing antiseptic solution of Zondo-fluid 1 in 500, for half-an-hour prior to the operation. The animals, after being cast, the parts and the surrounding portions were washed with soap and water, and well disinfected with solution of Zondo-fluid 1 in 1,000.

Technic.—A tape previously placed in Zondo-fluid solution 1 in 1,000 was tied round the scrotum, high up, near the external inguinal ring, to prevent retration of the testes. In Cases No. 1 and No. 2, incisions were made on each scrotal sac parallel to the median raphe, and the testes and the cords were exposed and dissected, the membranes covering being slowly torn with fingers, taking care not to injure the vessels. Clamps were put on, and the cords severed by means of hot irons. It may be mentioned that clamping and severing

of both the cords in Case No. 2 were done at one and the same time, but in Case No. 1 each testis was taken separately.

Case No. 3.—The incision in this case was made on the median raphe, and both the testes were exposed, and the operation completed as in Case No. 2.

The wounds were well washed with solution of Zondo-fluid, 1 in 1,000, and plugged with aseptic cotton wool, wrung out of the same solution, and the adjoining portions anointed with carbolized vaseline, 1 in 16.

No dressing done on the second day, but on the third day the swelling was fomented with hot water containing "Neem leaves" (*Azadiraehta Indica*), and these fomentations were continued for about a week. The wounds were daily washed with Zondo-fluid solution 1 in 1,000, injected with aqueous solution of iodine, and plugged with cotton wool soaked in iodine solution for first six days, and subsequently with the dressing oil :—

Re

Creasoti ..	..	℥ii
Acid Carbolic	..	℥iv
Ol. Terebenthin	..	℥i
Sweet oil	..	Oi

Misce Fiat Applicatio.

Case No. 1 was discharged cured in three weeks, but the other two cases took ten days more, as both the animals struggled at the time of the operation, and there was some straining on the cords. The wounds had also to be scraped twice on account of slight induration.

The animals were given clean bedding of hay every day, and were allowed certain quantity of lucerne, and were exercised for half-an-hour in the stable daily. For the first four days they were put on bran only, with 15 lbs. of hay ; after this, they were given 5 lbs. of gram crushed and soaked, ½ lb. of bran, and 15 lbs. of hay, and ¼ oz. of salt.

My colleagues in the Department and I have had a number of other cases for castration, in which animals were not prepared for the operation the previous day ; operation done by the methods described above, and after-treatment consisted of washing the wounds with Zondo-fluid solution, injection of iodine solution, and dressing with carbolic oil 1 in 20. Cure effected in from four to five weeks. No stiffness as the result of wound infection, nor any untoward effects have occurred in any of the cases. We always cast the animal for castration.

INTERESTING NOTES FROM VENEZUELA.

By E. MORGAN, M.R.C.V.S., D.V.H.
(*Puerto Cabello*).

Reading the "Interesting Cattle Cases" of Mr. I. R. Rigby, M.R.C.V.S., in The Veterinary Journal for last December, has been the cause of recalling to me several cases which resembled them—in many respects; these occurred in my practice in Cardiganshire in the late spring of the year 1913. All the animals I attended were either white or contained a certain amount of white-coloured hair on the body. There was one particular difference between our cases, inasmuch as all mine were animals under two years old. The age, time of the year and many of the symptoms made me think at first that it was an outbreak of Black Quasher. But in these cases the skin was as hard as a board and absence of the crepitating noice. Eventually, in most of the cases, the skin commenced to slough at certain areas, and they appeared then a worse sight than before, although I found that this was the only hope of recovery, as the few which remained hard in spite of scarification, fomentation, setoning and in few cases I even injected turpentine subcutaneously, yet death supervened in about a fortnight after the first symptoms of the disease; all the fatal cases were white throughout, *i.e.*, entire skin and hair. These cases were in some instances long distances from one another, in scattered practice. At one farm the majority of the yearling cattle had the disease; at other farms perhaps one or two cases amongst the herd. They were all out on pasture at the time. I need not dwell longer on these particular cases as the treatment in the medicinal line was more or less similar to the one mentioned by Mr. Rigby, only that in one case—a 2-year old white heifer, in extra good condition, which prolonged more than any of the other cases—I tried pot. iodide, but without results, as the case eventually died with extensive hard swellings on the body. The cause of this disease has always remained a mystery to me.

There is a peculiar skin disease of cattle in Venezuela which is called in Spanish "Arestin," which is an excoriation or cutaneous eruption. All the cases I have noticed were fully grown cattle. It only affects white or lightish coloured areas. It never happens in black cattle. In black and white cattle it is most pronounced at times, inasmuch as the white areas are diseased and the black areas quite healthy. It forms a kind of scab along the back and is most prominent above the loins and hind-quarters. It appears as if earth has been spread along the back. They eventually form hard callosities similar in consistence to the horny chesnuts on horses' limbs. They sometimes form fairly large protuberances and when these are irritated, as is often

the case when a herd of bullocks are together, and one mounts the other, then the surfaces of these bleed, with the result of flies blowing on them and maggots are formed. It seems to be confined to the superficial layers of the skin. I often examine these cattle and their carcases afterwards at the abattoir. It causes a great deal of inconvenience and pain to the animal at times. When it is extensive along the back, these cattle are generally in a lower condition than the rest. Again it deteriorates the hide to a certain extent, although it does not penetrate through, but sometimes these areas are prominent when salt-cured hides are taken out of the pack for exportation, after remaining in the salt for at least one month.

I have made enquiries from many of the cattle breeders in Venezuela and they are all agreed that it is only met in white or nearly white-coloured areas on the skin. Also the majority seem to agree that the heat of the sun has something to do with its formation. I have only met these cases in cattle which are pastured in the open with very little shade, and also in working oxen, which are most of the time working in the open without any protection against the piercing rays of the sun. Whether mosquitoes and other flies alight and irritate these light-coloured areas and then the strong rays of the sun follows and aggravates matters is difficult to solve, but it is quite feasible. Again, why are the backs or upper part of the body, in most cases, only affected? Possibly these are the areas least protected against flies and the rays of the sun. On account of their greater power of resistance to this as well as other diseases, some breeders on the plains endeavour to breed black cattle by allowing only black bulls with their herds. Also some keen observers of such matters as these only train dark-coloured animals as working oxen on account of these complaints.

In this country and Columbia there is a mosquito " Janthinosoma Luizi," which is a carrier of the eggs of a fly called " Dermatobia Cyanwentis " (Macquart, 1843). They deposit the eggs on the skin of cattle of all ages, but more often they attack cattle with white hair and white skin. The larvæ (or, as it is called here—nuche) is said to enter the skin, the adhesive portion is beset with hooklets and has two strong oval hooks. The posterior end carries the stigmata. If left to themselves the larvæ will remain in the skin for some time and finally escape to drop on the ground and form pupæ and imagos. In size and character they, in many respects, resemble the " hypoderma bovis," but in the majority of cases are found behind the elbow where the hair is fine, also between the hind-quarters above the scrotum and sometimes in the neck region. They cause trouble and the animals sometimes, if not attended to, waste into mere skeletons, as these areas often

bleed due to their presence, and form an extensive deep lesion often several inches wide. They seem to develop quickly to a large size, *i.e.*, the larvæ, as I have noticed them in young calves, so they complete their life-cycle much quicker than the hypoderma bovis in Great Britain.

There is a race of cattle in Columbia called " Ganado Antioqueño," with black points, white hair and black skin ; these are almost, if not absolutely, free of these larvæ of Dermatobia, although they are white, except at the extremities, but the skin is black.

Cattle breeders inform me that even bats molest white more often than black stock. The reason for this is, I think, not on account of the character of the skin, but as the bat glides through the air at night, and obviously white animals, amongst a mob are more visible than darker ones, so he comes against his victim sooner, should it happen to be while on a dark night. Bats cause heavy losses in calves and foals in this country by sucking their blood. Even pigs and fowls are not exempted. I have noticed horses even too weak to walk on account of bats draining their blood every night. Young animals are unable to resist so well as older ones, so they die very soon from deficiency of blood. A breeder of pure-bred imported pigs had to dispose, the other week, of his whole lot of sows on account of the bats. They had eaten all their teats, both young and old alike. Many of these sows farrowed, but the young pigs naturally died as there was no means of getting milk. One has to be careful while buying breeding sows here to examine each gland, as they appear to be present, especially in old sows, on account of the size of the gland, but the teats are missing very often.

It is most interesting the way this little flying, bloodthirsty mammal taps the blood vessels in fowls. They bleed them through the aural orifice, possibly this being due to the feathers interfering with their beaks in other parts of the body. Naturally, fowls sleep with their heads protected under their wings, so the intruder cannot easily get at their heads. This might possibly be one reason why fowls sleep with their heads in this position. One would little think during the daylight, when he comes upon these " silent bats in drowsy clusters cling," as Goldsmith said, that they could perform murderous deeds at night, and hypnotise the wild horse of the open plains, and even go beyond the protective forces of nature by withdrawing the blood of fowls in such an insidious manner. They have been caught on several occasions in the act of drawing the blood. The hens are found in the morning almost too weak to stand, and in most cases they succumb. It is marvellous how they deprive their victims, both large and small, of all sensation ; the animal does not attempt to repel them. The

bat; while withdrawing the blood, continually flutters its membraneous wings at a rapid pace, like a hawk or a honey bird when they stand on air in the same position; this seems to hypnotise the victim and may possibly act like ether on their flesh.

Farmers in many parts of the world object to white cattle as being of a more delicate constitution than others of darker colour. It was mentioned by the late Professor Darwin that male white cats with blue eyes are generally deaf; also that colour and constitutional peculiarities go together. He mentioned facts collected by Hensinger that white sheep and pigs are injured by certain plants, whilst dark coloured individuals escape. He mentioned that Prof. Wyman had communicated to him a good illustration of the fact: On asking some farmers in Virginia how it was that all their pigs were black, they informed him that the pigs ate *paint-root* (Lachnathes), which coloured their bones pink and which caused the hoofs of all but the black varieties to drop off, and that they selected the black members of a litter for raising, as they alone had a good chance of living.

There are several diseases of animals in Great Britain which we know as being more prevalent in white or grey animals—ex. " white heifer disease," and " melanotic growths " in grey horses. Stock breeders do not object to white-coloured animals without strong reasons.

It is well known, according to authorities on tropical diseases, that pigmentation follows sunburn, but until recently it was not evident that it was of a protective nature. Unna, in 1885, was the first to say that it was to be regarded as useful, inasmuch as it prevented inflammation.

In 1896 Finsen painted a black ring two inches wide around his arm with Indian ink to imitate the colour of negro's skin and then exposed it for three hours to a very hot sun. For a time the skin remained normal, showing only a little redness at the edge of the black paint, but in due course it became red and inflamed, except where it had been painted black. After several days the erythema disappeared and the area which had been red was noticed to have become distinctly pigmented.

He then exposed it again to the sun, but this time the area which had originally been covered with Indian ink was unprotected. The result was that this part became red and inflamed, while the pigmented area was unaffected, except that it became a little more pigmented.

The experiment of Finsen shows that the colour of native races living in tropics is protective and was possibly originally induced by

the sun. The black skin is protective because it guards the nerve endings from irritation.

As to the origin of the pigment this question, according to those who have made a special study of it, must be considered as far from settled.

There are two possible sources for the melanin :

1. The hæmoglobin of the blood.
2. The cells of the epidermis.

This question of the origin of pigment should make an excellent field of study to some young graduates fresh from our veterinary schools and before the rust of time has an opportunity to step in, unawares, to blur the lustre on their knowledge of anatomy, chemistry, histology, physiology and pathology, most essential subjects for the study of this colour mystery.

SOME CASES OF CALCULI OF THE BLADDER IN CANINE PATIENTS.

By FREDERICK HOBDAY, F.R.C.V.S.
(*Kensington, W.*)

In the March issue (Page 89) of The Veterinary Journal, I published, in conjunction with Mr. Harold Stainton, M.R.C.V.S., an interesting skiograph of calculus in the bladder of a Pekingese bitch, this being successfully removed by supra-pubic cystotomy.

It is strange how it sometimes happens that one gets a sequence of cases of the same variety, and since then we have had no less than eight others, five of the patients being females and three males. Of the females one was almost moribund from another cause when brought to hospital, and died shortly after arrival, a large calculus being found in the bladder on *post-mortem* examination.

One female, a Pekingese, five and a half months' old, had 25 calculi (two about the size of a filbert nut and the others about the size of a pea) removed by supra-pubic cystotomy and made an uninterrupted recovery.

One of the males, a bulldog, brought in on the same day as this latter bitch, had 63, another had 27 small calculi removed from the urethra and also made a good recovery ; whilst the third, a cocker spaniel, was of particular interest, because it was only 11 months' old and it had had the symptoms of bladder irritation sufficiently marked to be noticeable to the owner for five months. When brought to hospital it had complete incontinence of urine and was continually straining ; the appetite was capricious and the dog was evidently in a good deal of discomfort. Examination per rectum and palpation of the exterior of the abdomen, revealed the presence of a calculus which had appar-

ently become adherent to the bladder wall and was wedged in the region of the neck.

Under chloroform an incision was made at the left of the prepuce and a calculus as large as a good-sized filbert nut was removed by the supra-pubic operation. The incontinence ceased three days afterwards and recovery, except for a little buried suture trouble, was uninterrupted.

BOTS IN THE ŒSOPHAGUS.

By WM. PAUER, M.R.C.V.S.
(*Blackwater*).

At the end of May I was asked to attend to a bay gelding, an Army " boarded out " horse. He was in fair condition and the owner informed that me since the previous day food had been coming back through the nose and that coughing was frequent. When he drank a considerable quantity of water also returned through the nose. I watched him feeding and drinking and found that this took place immediately after swallowing. The animal was bright, temp. 101° and appetite was good. These symptoms continued for 10 days and his condition, when eating, was always the same. There was no swelling in the throat and at no time did he show choking symptoms other than the return of the food and water. I formed the opinion that there was a partial œsophagal obstruction, but was at a loss to account for it. On June 9 he had acute abdominal pain and died after 10 hours' agony. *Post-mortem* showed that this was due to twist of the large intestine. I continued the *post-mortem* examination and found that the lining membrane of the œsophagus four inches from the stomach entrance was simply packed with bots ; they extended for about five inches and were obviously responsible for the difficulty in swallowing. The remainder of the œsophagus was normal. He was entirely on a green clover diet during his illness. I regard the intestinal twist as a coincidence.

AN INTERESTING ABDOMINAL WOUND IN A HEIFER.

By GEORGE GIBSON, M.R.C.V.S.
(*Oakham.*)

In December last, I was called to see a heifer which was stated to have been seriously injured in the abdomen by an axe, the owner stating that the intestines were protruding. The history was that the animal had been trying to get through a gap, and in order to stop her the owner's man, having an ordinary axe in his hand, had thrown it, intending that it should strike her with the flat side. Unluckily, she turned at the moment, and the axe struck her violently with the cutting edge, inflicting a severe wound, severing two ribs and exposing

the rumen and small intestines. I saw it about three hours later and at once advised sending for the butcher, but, being Saturday night, and no butcher immediately available, I sutured the wound, applied Bipp paste and instructed the owner to have her killed as soon as possible.

Passing that way two days afterwards, I called to see what had been done and found the animal still alive. There was no fever and she was eating as if nothing had happened. As the sutures had kept in place and she looked so well, we decided to give her a chance and within a few days the cow made an uninterrupted recovery.

The case is especially interesting on account of the small amount of disturbance shown, as there was no question about the severance of the two ribs ; the rumen and intestine being clearly visible. About a foot of the latter was actually protruding and the portion of rumen the size of half an ordinary football. It took more than half an hour's steady manipulation to get these back into place.

CRUDE OIL IN COOKING.

By CAPT. J. J. PLUNKETT, O.B.E., R.A.V.C.,
No. 14 *Field Veterinary Section, Waziristan Expeditionary Force.*

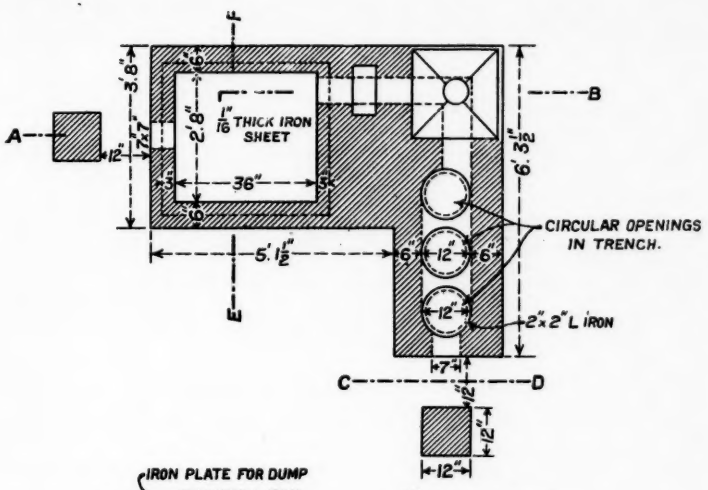
During the past few months practically all the cooking of men's food in my unit has been done by the combustion of crude oil.

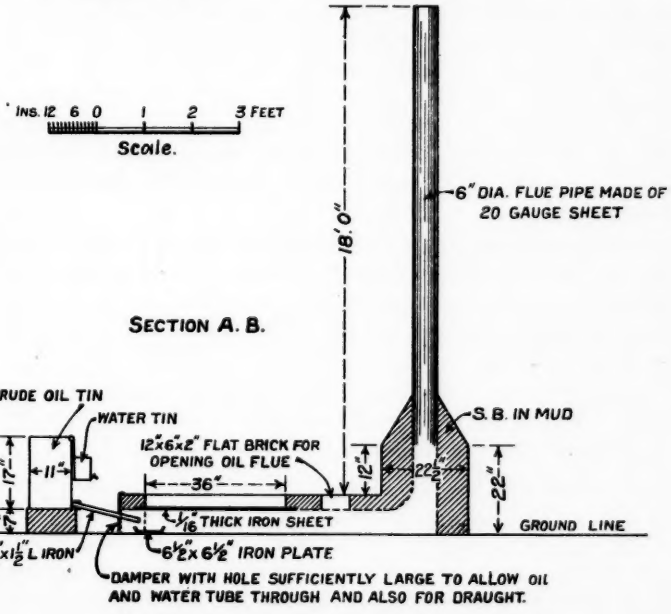
The ration of crude oil per man per day is 3 ozs. This is in lieu of one pound of wood, and represents half the fuel ration. The remaining half is in wood.

The apparatus required is planned on attached, and is working very satisfactorily up to date.

In this apparatus the crude oil tin is simply a four-gallon petrol tin with tap fitted. A steady trickle of oil is allowed to run from the tap into the tin tube, which conducts the oil on to the plate. The small tin simply hangs by a pair of wire hooks on to the edge of the large tin. It is the water container. The water is allowed to flow at drop-drop pace on to the tin tube, where it mixes with the oil and flows on to the plate. Two such water and oil tins are required for the " Degchi " end, and one for the " Chappatti " end.

The Degchi range is simply two thin walls of unburnt bricks and mud, with a trench between them. Three circular four-gallon copper or brass degchis are sent in, resting on " L " iron, which is resting on the walls. The degchis are set in mud plaster for about four inches from the bottom, and easily lift out. When replaced, a little plaster of mud between them and the dry plaster prevents the escape of heat and smoke. It is necessary to change the pots frequently, as the one nearest the oil gets the best of the flame.


F
A
B
E
C
D
3'8"
2'8"
36"
6'3½"
5'1½"
7x7
12"
1/16" THICK IRON SHEET
CIRCULAR OPENINGS IN TRENCH.
6"
12"
2"x2" L IRON
7¼"
IRON PLATE FOR DUMP
HOLE FOR L IRON
24"
10½"
GROUND
LINE
SECTION C.D.
SECTION E.F.


INS. 12 6 0 1 2 3 FEET
Scale.
18'0"
6" DIA. FLUE PIPE MADE OF 20 GAUGE SHEET
SECTION A. B.
CRUDE OIL TIN
WATER TIN
12"x6"x2" FLAT BRICK FOR OPENING OIL FLUE
11"
17"
36"
12"
22½"
22"
S. B. IN MUD
GROUND LINE
1/16" THICK IRON SHEET
1½"x1½" L IRON
6½"x6½" IRON PLATE
DAMPER WITH HOLE SUFFICIENTLY LARGE TO ALLOW OIL AND WATER TUBE THROUGH AND ALSO FOR DRAUGHT.

The end of the trench nearest the oil and water tins should be stopped by a thin iron damper with opening just large enough to admit the oil tube. This helps the draft very much.

The chappatti plate is set on walls like the degchis, but the width of the trench is greater. The plate is 1-16th inch thick. Thicker plate was tried at first, but was not so successful, as it took much longer to heat.

The taps used in the oil cooker of this unit were invented by Sergt.-Major Palmer, the supply from Military Works being too clumsy. This tap is simply a motor bicycle valve with a stopper tube fitted into it. This second tube, by screwing in or out, lessens or increases the valve opening and makes an excellent control for the oil and water supply.

The combustion is started as follows: A supply of oil and water is poured into the tins, all cooking pots and dampers are put in position. Some tow, soaked in crude oil, is put on to the plate in the trench, and lighted. The damper is then put back, and the flow of oil is regulated to a steady constant stream from the tap. The water is allowed to drop, drop slowly.

As soon as the plate is hot, remove the tow. The hot plate is very important in the process of combustion. The oil and water must pour steadily on to the plate, and not flood it. If the draught is right, a roaring noise is soon heard inside the trench, and the enormous flame heats the chappatti plate sufficiently in a few minutes, and gradually cooks the contents of the pots. The only outlet for air should be as far as possible the chimney. It must be cleaned often. This can easily be done from above with a long stick and some sacking, and the movable brick below makes it easy to clean the trench and remove the soot.

Owing to the experience and marked keenness of F.Q.M.S. Palmer, my oil cooker was the first to work satisfactorily in Dera Ismail Khan, and was a great help to the M.W.S. as a pattern. All the handiwork of fitting taps, tubes, etc., and the whole supervision was carried out by F.Q.M.S. Palmer.

A meal for 110 men can be cooked comfortably in one and a half hours. This means about twelve gallons of liquid such as dhal and curry to cook, and 220 chappattis.

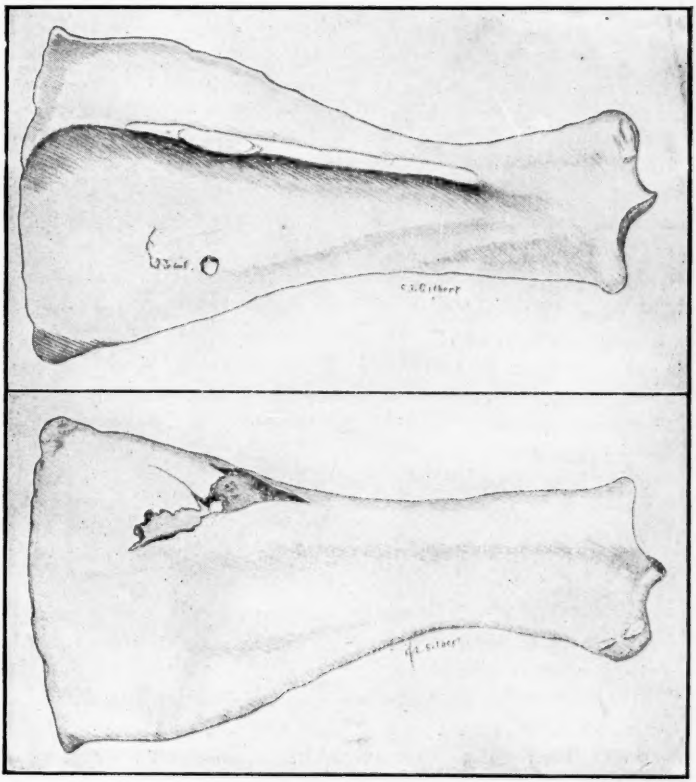
The cooker is worked entirely now by Syces, who are employed as cooks. They had to be very carefully supervised for some time, owing to their aversion to leaving their old-fashioned wood fire, but now they realise the comfort of no smoke and easier working, and are more devoted to the oil fire. I hope, with time, to work on a little

less crude oil, as I believe at present the cooks waste a little which might be saved. This, of course, is largely due to the fact that they are not very intelligent or extra keen.

THE INGRESS AND EGRESS WOUNDS OF A BULLET THROUGH THE SCAPULA.

By FREDERICK HOBDAY, F.R.C.V.S.
(late Major, Royal Army Veterinary Corps).

THE subject of the illustration is of great interest in that it shows the apparently slight injury to a flat bone (the scapula) at the point of entrance, and the shattering which takes place at the point of exit.



This has been observed and written upon by numerous writers, but these illustrations add another item of fact.

The patient, a light draft horse, was evacuated to No. 22 Veterinary Hospital with a small bullet wound in the shoulder, not at all a formidable-looking wound, and the animal was not excessively lame at the time. Progress was, however, unfavourable, and even tually the animal was destroyed.

Post-mortem examination revealed the splintered pieces of bone imprisoned behind the scapula, and when the bone was boiled out, the condition of affairs was shown as in the drawings, which were made at the time.

Abstracts.

ON THE TREATMENT OF UMBILICAL HERNIA IN THE HORSE WITH CLAMS.

By PROFESSOR SCHWENDIMANN,
of Berne.

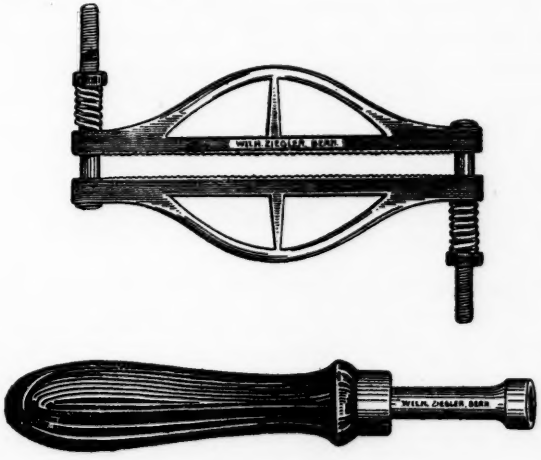
Cases of umbilical hernia in foals are more frequently met with in the clinic to-day than formerly. Very seldom do we meet with intact hernia; for before the animal is brought to us for treatment all that is possible has been done to remove the defect. One often finds the skin cicatrised, thickened and consolidated with increased growth of the hernial tissues underneath or adhesion of the hernial contents to the skin. It is evident that such complications render treatment more difficult and limit the chances of cure. On this account I am describing a method of treatment applicable to private practice. It is the oldest method known and means the clamping of the hernial sac. The possibility of a bloodless taxis, as well as a not too large hernial ring, are essential conditions for its employment. In other cases radical treatment consisting of herniotomy and direct union of the hernial ring by suturing is to be preferred.

Clamping is often put off for unreliable palliative cures. The success of these is quite uncertain. My view is that the method of procedure is far less important than the handling of the case. It is not always sufficient to put on a more or less firmly fixed clam, but a whole series of conditions must be observed, if a good result is to be produced. In literature and text-books much too little stress is laid on these important points.

First of all, the nature and construction of the clam is of substantial influence. Wood, iron and aluminium clams are all unsatisfactory. They close too faultily or are too weak, stretch and act unequally or insecurely. On this account all these clams are to be avoided whose parts are bound at the ends or are furnished with a hinge. On closing such clams, pressure can never be equally maintained. All clams

bent on the surface or edges are unsuitable or quite superfluous. A good clam is made of best steel, whose level arms are closed at both ends with a screw encircled by a nut.

An ideal one is that of Salvisberg. All parts consist of steel. The arms are flat and widely windowed, furnishing light weight with solidity. The grooved pressure surface is only 7 millimetres broad and with the continued spring pressure at both ends acts so steadily and uniformly that the removal of the whole extent of the hernial sac is accomplished in 15-20 days.



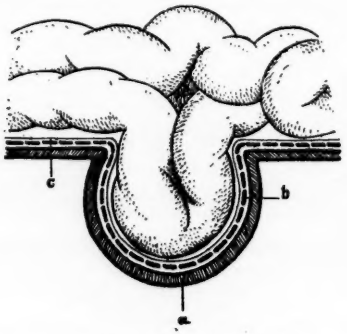
Salvisberg's Clam and Screw Key.

The operation should not be performed on too young a subject. Apart from the fact that small umbilical hernias disappear spontaneously in yearlings and the danger of strangulation is small, it is my opinion that it is advantageous to have a certain firmness in the abdominal coverings. On septic and antiseptic grounds it is essential that the whole area, and around it, of the hernial sac should be shaved. The hair should be clipped off to avoid the destructive effect of the clam.

The only great danger with which we have to reckon and of which we ought to acquaint the owner, is tetanus infection. To limit the recurrence of purulent inflammation, the shaved and disinfected skin is painted with tincture of iodine.

The reposition of the hernial contents presents no difficulties in simple hernias and is generally accomplished with the animal on its back

The subsequent method of putting on the clam is of the greatest importance. It is essential that *not only the skin, but always also the fascia transversa abdominalis and with it the extruded portion of the peritoneum must be embraced by the clam,* otherwise it is certain a mishap will occur. As Gustmann has observed, in the clam method it is essential that the serous surfaces of the hernial sac adhere to the greatest possible extent.



The Hernial Coverings of Umbilical Hernia in the Horse.
a. Skin.
b. Fascia Transversa Abdominalis.
c. Peritoneum.

But this can never happen if the fascia with its peritoneal covering is shoved back, or quite reduced with the hernial contents, so that they cannot be included in the clam pressure. The most important moment of this simple operation is the proper putting on of the clam. It is done in this way that the hernial tissues (skin, fascia, transversa and peritoneum) emptied of their contents, are drawn through the moderately opened clams, whilst an assistant on the opposite side holds the clam with both hands firmly pressed up to the abdominal wall, so that the instrument may be brought as near as possible to the hernial ring. The clam is now closed with the screw key, or better still, with screw keys operating at both ends at the same time. During the whole procedure the assistant remains at his post and presses the clams to the belly. After these are fixed sufficiently firmly, one takes time for their further closure and does it at intervals.

Where a large hernia exists, or where the opening into the sac has been destroyed, the clams can be put on obliquely or diagonally. With very large hernias, however, I prefer herniotomy.

If the clam has been put on rightly, the transversas and peritoneum can be felt in the hernial sac just as one can feel the fold of the shirt through the coat-sleeve.

After letting the subject up, bandages may be put through the windows of the clam and fastened on the back or sides so as to support it and keep it well up to the belly.

After-treatment is simple, the screws are tightened once or twice and when pus forms on the wound rinse with sublimate water and dust with wound powder. After falling off of the hernial sac cleanse the wound and dress with aloes and tincture of myrrh.

Do not fasten the food up but put in a loose box.

—*Swiss Veterinary Journal.* G. M.

ABSTRACT FROM THE WORK OF THE DIVISION OF VETERINARY SCIENCE IN CALIFORNIA, U.S.A.*

Making Cattle Environments Free from Infective Tuberculous Material.—The conditions under and the influence to which tubercle bacilli from tuberculous cattle are exposed outside of the animal body are many, and in our experiments it has been our aim to represent the most important of such, especially as they obtain in California.

In two series of experiments Traum has found that, when tubercle bacilli from lungs of infected cattle were exposed in a 1 in. thickness of manure on the ground, they were alive, in one series, at the end of 140 days and, in the other, at 71 days. In the first series, they were dead at 171 days and in the second at 94 days.

Tubercle bacilli, exposed in the first series, retained their virulence for guinea pigs for over two months longer than those in the second series under practically the same conditions. These results are in accord with the findings in our other experiments. The facts to bear in mind are that the two experiments were planted two months apart and that in both cases the tuberculous material became innocuous soon after the rains stopped, when they were no longer kept moist. There appeared to have been very little weakening of the tubercle bacilli during the rainy season.

A third series was carried out to determine how long tubercle bacilli would live when exposed to California climatic influences when no rains intervened and to what extent cattle would become infected with such materials. Seventeen days after being placed in the experiment plot, tuberculous material exposed in 1½ in. thickness of manure was no longer able to produce tuberculosis in either guinea

*From the Report of the College of Agriculture and the Agricultural Experiment Station of the University of California (July 1, 1918, to June 30, 1919).

pigs or in cattle. The guinea pigs were given direct inoculations, while the cattle were exposed in a small pen and forced to be in a cloud of dried tuberculous matter for an hour on each of two successive days, and were also fed with hay thoroughly mixed with the dried tuberculous material.

In water holes, on the other hand, we find 687 days after exposure in one experiment and 548 days after exposure in a second, that the tuberculous material is still capable of producing tuberculosis in guinea pigs when inoculated. The end point in first experiment was apparently reached.

In the case of exposure of tuberculous material when kept moist as in a water hole, it was deemed necessary to determine to what extent the cattle would become infected when exposed to such material. We found that all of three cattle became tuberculous when forced to drink water taken from water holes ninety-eight days after such holes were infected with tuberculous material. The end point in this experiment was not yet reached. All of six cattle exposed earlier in the experiment also became infected.

The practical significance of these findings is very evident, namely :

Environs contaminated with tuberculous discharges from cattle become free from such infective materials soon after the media in which they are contained are freed from sensible moisture. On the other hand, tubercle bacilli that are found in water holes, mud holes and watering troughs retain their virulence for a considerable length of time.

Chicken-pox (*Epithelioma Contagiosum*).—Losses from this disease have been greatly reduced by the use of a vaccine distributed by this station. The preparation and use of this are described by Beach in circular No. 145 of this station. One injection will usually produce sufficient immunity to protect fowls against natural infection for a year. The immunity does not reach its full development until three to six weeks after vaccination. Experience in the field has shown that occasionally a second injection is necessary to stop the spread of the disease. The vaccine appears to have considerable therapeutic value when administered to infected fowls. When properly administered, it is harmless to healthy fowls. It does not retard the development of growing fowls, nor directly decrease the egg production of laying hens. It has been found that the immunising value of the vaccine varies in direct proportion to the virulence of the virus contained therein. It has not yet been possible to perfect a vaccine

which will always produce absolute immunity against severe artificial infection.

In inoculating Leghorn cockerels for the production of chicken-pox virus used in the preparation of vaccine, the amount of dried scabs produced per bird was about 4 grams. The mortality of the birds used was over 50 per cent. The amount of scabs produced per bird was greater, and the percentage of mortality less during warm weather or when the birds were kept in a warm room. Pox of turkey was found to be transmissible to chickens, and chicken-pox to turkeys.

Sour-Milk Treatment for Poultry Diseases.—In confirmation of observations at other stations, it has been found that coccidiosis in chicks and entero-hepatitis in turkey appear to be beneficially influenced by a sour-milk diet. Observations covering a period of three years show that these diseases have been promptly checked and birds successfully matured in infected yards when fed liberal amounts of sour milk with a restricted grain and mash ration. Further work should, however, be done to establish the value of this mode of treatment with certainty.

Bacillary White Diarrhœa.—To determine the efficiency of the "Intradermal Test" for the detection of *Bact. Pullorum* infection in mature fowls, 140 birds were subjected to both this test and the "Agglutination Test." The results indicated that the Intradermal Test is not reliable.

One outbreak of a rapidly fatal disease of mature fowls which caused a loss of more than 25 per cent. of the flock was found to be due to *Bact. Pullorum* infection.

Avian Tuberculosis Detected by Intradermal Test.—This disease has been found in flocks in several different sections of the State. The results of an investigation of the "Intradermal Test" would seem to confirm the work of Van Es that this is a fairly reliable means of detecting tuberculosis infection in fowls.

Fowl Cholera in Turkeys Not Controlled by "Bacterins."—In turkeys, the results of an investigation of the value of autogenous bacterins in control of the disease seems to indicate that the bacterins have neither curative nor immunising value.

Intestinal Round Worms Expelled by Tobacco Dust.—Investigations in co-operation with Dougherty in the control of round worms has shown that "tobacco dust," added to dry mash in the proportion of

1 lb. tobacco to 50 lbs. mash and fed daily for two or three weeks is an effective means of expelling these parasites. Good results were also obtained with tobacco dust given in a single dose in dry mash, using 1 pound for each 100 birds. The results of investigations not yet completed, of the efficiency of tobacco dust for preventing round-worm infestation and the effect on growth of chicks, if fed daily or intermittently from the age of 30, 50 or 70 days to maturity, seem to indicate that it can be safely fed daily in the proportion of 1 pound of tobacco to 50 pounds of mash from the time the chicks are 70 days old and for periods of 20 days, with an interval of 20 or 30 days between during which no tobacco is fed. Since neither the treated nor check pens have thus far become badly infested with round worms, no information regarding the efficiency of this method of preventing round-worm infestation has been obtained. Oil of chenopodium (American wormseed) proved effective for expelling round worms. The amount used was 1 teaspoonful for each 12 birds, mixed with moist mash. As a single-dose method of treatment this seemed to be more desirable than tobacco dust. The results of preliminary trials with the leaves of plants from which oil of chenopodium is derived indicated that they might be an effective vermifuge for poultry.

Diseases of Sheep.—The increase in the number of inquiries concerning diseases of sheep received recently by this station can be attributed to two causes, *i.e.*,

(1) The rise in value of these animals which is causing owners to take more precautions against loss ; and (2) the increase in the number of flocks in the State kept on small farms.

In the latter case the animals are confined in fields during the entire year and usually receive more abundant feed and less exercise than range sheep. These conditions predispose to preparturient paralysis and similar diseases.

Preparturient Paralysis of Ewes.—Has been investigated by veterinarians of this Station. It attacks fat ewes several days before due to lamb. The cause of the disease has not been definitely determined, but lack of exercise and over-feeding of animals in such condition are no doubt primarily responsible for the trouble. The affected ewes are dull, listless and aimless in their movements. In advanced stages, there is a loss of vision, staggering gait or inability to rise. After five to eight days of illness, the animal usually dies

Prevention has been successful and consists in avoiding conditions that make for the excessive deposition of fat. This can be done by limiting the amount of dry feed given to ewes during the last month of pregnancy and making them rustle for their feed to give them plenty of exercise. Grazing in pastures containing green feed for one or two hours a day will have the effect of giving them succulent food and exercise at the same time.

The ill effects of heavy feeding and lack of exercise are not always confined to the ewes. When sheep in fat condition begin to die, it is usually advisable to move the animals and to change and reduce the feed.

Genito-Urinary Infection in Sheep.—An affection of bucks was investigated which manifests itself chiefly by marked enlargement of one or both testicles and is termed " Big Ball " by the sheep men. A number of cases were examined by Hart, and postmortem examinations held which showed that the testicles were not the only parts affected in all cases. Marked changes were found in the kidneys, bladder, prostate glands, urethra and penis. The infection progresses to the point of pus formation and necrosis of soft tissues. In some cases the entire testicle is destroyed. Cultures made from the affected areas on blood agar developed an organism which proved to be *Bacillus pyogenes*. This organism when injected into the testicle of a healthy buck produced a slowly-progressing inflammation accompanied by pus formation similar to the naturally infected cases.

A number of fatalities occurred from the disease, but its most serious aspect was the fact that a band of these bucks which had either not been visibly affected or had apparently recovered, when bred to ewes, produced a very low percentage lamb crop, amounting to about 33⅓ per cent. The mode of infection has not been definitely determined, but some evidence was found to show it had occurred through the urethra. The bucks were being kept on very good green feed, and in a large band of several hundred head corraled each night. They were practising sodomy upon each other to a marked degree. and it was from this source that the infection most likely originated,

Treatment of affected animals is unsatisfactory, castration in some cases being indicated.

Prophylaxis would consist in keeping the animals on less stimulating feed without crowding them together at night in corrals, or in dividing them up into much smaller bands.

Necrobacillosis in Lambs.—Two serious outbreaks of necrophorous infection (*necrobacillosis*) in baby lambs were investigated. The disease in this form is somewhat unusual and, in the two flocks mentioned, caused the lambing percentage to drop to about 75 per cent. Lambs are predisposed to this organism through being born in unsanitary lambing sheds or in muddy pastures. Infection presumably entered through the navel and caused death in these cases in from 24 to 72 hours after birth. The most evident lesion appeared in the liver and was characterised by the formation of multiple necrotic areas of a grayish-yellow colour, varying size from a match head to a pea. The necrophorous organism appeared in smears stained from the border of the necrotic areas. Some cases also showed gastric infection. Cleaner lambing quarters, with disinfection of the navel at birth with iodine, were recommended and resulted in an appreciable cessation of deaths.

Reviews.

JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION. May, 1920. Edited by J. R. MOHLER.—Washington, D.C. Price 3 dollars, 60 cents.

THIS "journal" is getting back to full post-war vigour. The Editor has a well-reasoned and forcible article on "The Veterinarian and Civil Service." The Joint Congressional Commission has been busy on the Reclassification of Civil Salaries, and it has failed to grasp the scientific usefulness of the veterinarian to the country, and has discriminated against him in regard to both rank and salary. The lay and veterinary inspectors of the Bureau of Animal Industry have a just cause of grievance against the Government in this respect, and they have a fine champion of their cause in the Editor, who takes up the cudgels for them with no uncertain grasp. The keen attention to detail necessary to overcome outbreaks of "White or Calf Scours" is ably discussed by W. L. Williams, W. A. Hagan, and C. M. Carpenter. It is shown how important it is to have clean milk for bucket-fed calves. When a calf gets scours, the procedure is immediately to withdraw all food, give high enemas of physiological salt solution, and large doses of serum until the dysentery is checked, followed by bacterins employed freely. In some cases boiled, and in others autoclaved, milk as brown as coffee produced very good results, along with the therapeutical agents above mentioned, but a clean mother's udder and a clean hind end to the calf are also essential. Other subjects written about are "Strongylidosis in Horses and Mules," "Control of Abortion," "The U.S.A. Army Meat Supply," etc. A very concise and interesting article appears by L. C. Kigin, Lafayette, Indiana, on "The Purpose and Scope of Veterinary Extension Work." The

author s opening sentence is full of import to the veterinary profession. It is a point that needs stressing to-day—" The purpose of all extension work is to educate the masses along certain lines of work that will be beneficial to community welfare." The lines of education at work comprise " Disease Prevention Work and Veterinarians and Disease Prevention Work with Farmers," and we may add " all stockowners." How true it is that modern science and up-to-date intelligence ought to concentrate on eternal instruction and insistence on the measures to adopt in the prevention of disease rather than in its cure.

" Abstracts, Army Veterinary Service List, and Reports of Veterinary Medical Societies " conclude the publication, and in a communication to Dr. Eichhorn, the Secretary of the British Section of the Committee expresses a doubt as to whether the nations of Europe will take up the holding of a National Veterinary Congress for some years to come. G.M.

ANNUAL REPORT OF THE EGYPTIAN MINISTRY OF AGRICULTURE, 1917.

WE have before us the Annual Reports of the Veterinary Service of the Ministry of Agriculture, Egypt, for the years 1916 and 1917. The reports show good work done under very difficult conditions, as during these two years Egypt was practically a back area of our fighting fronts.

Cattle plague in 1916 only accounts for 18 deaths, a very marvellous record seeing that for the whole period from June, 1903, when the disease made its reappearance in Egypt, 176,564 deaths have been reported. In the years under record the outbreaks occurred in Ginga and the Dagahlêya Provinces where certain animals were infected with virulent nasal discharge and then injected with anti R. Serum, but no double inoculations were carried out. During the four years, 1913–16, 289,423 cattle have been doubly inoculated and amongst these only 828 cases of rinderpest have occurred, the curve giving the incidence of the disease showing a sharp decline during the last three years.

In 1917, 4,794 deaths from cattle plague were reported, and the number of anti-rinderpest inoculations carried out was 80,036, of which 77,641 were serum and nasal discharge. The total deaths from cattle plague amongst those inoculated was only 6.

Rabies: 78 cases are reported in 1916, and 126 in 1917.

The following animals were affected:

	1916	1917
Dog	72	111
Cat	1	5
Horse	1	1
Cattle	1	2
Donkey	3	2
Wolves	..	4
Buffaloes	..	1
	78	126

In 1916 7,303 ownerless dogs and cats were seized and destroyed in Cairo and 9,339 in 1917..

In the city of Alexandria, 5,596 ownerless dogs and cats were destroyed in 1916 and 2,858 in 1917, while in the provinces, 50,122 of these animals were destroyed in 1916 and 45,463 in the following year.

Glanders.—50 cases occurred in 1916 and 53 in 1917. The number for the former year including 2 cases which occurred amongst animals of the Expeditionary Force.

Epizootic Lymphangitis.—16 cases were reported in 1916 and 19 in the next year.

Anthrax.—The few cases which occurred were confined to the quarantine pens at Alexandria and Cairo.

Sheep pox.—91 cases were reported in 1916 and 123 in 1917.

Foot and Mouth Disease.—The country is stated to have been free from cases of this disease in 1915, but it appeared amongst animals imported from Cyprus and the Sudan in 1916, and in that year 10,635 cases are reported. These fell to 759 in 1917; all of the cases, except 12 in the latter year, occurred in the quarantine pens amongst animals from Cyprus and the Sudan.

Hæmorrhagic Septicæmia.—81 cases occurred amongst buffalo cattle and camels in 1916 and 87 in 1917.

Croupous pneumo enteritis of sheep.—46 cases were reported in 1917.

Trypanosomiasis.—60 cases reported in 1916 and 148 in 1917. In the former year the majority of the cases reported occurred in the Faîyûm, whereas in the following year the disease would appear localised around Cairo and the Canal.

Piroplasmosis.—

	1916	1917
Horse	14	1
Cattle	155	117
Sheep	49	2

Tuberculosis.—1,829 cases were reported in 1916 and 3,737 in 1917.

Contagious bovine pleuro pneumonia.—In 1916, 187 cases of this disease are reported amongst cattle arriving in quarantine from the Sudan and 163 cases amongst similar cattle in the following year, whilst 18 cases were also detected amongst cattle from Cyprus. No cases occurred amongst Egyptian cattle in either year. The disease appears to have been very prevalent in the Sudan in 1915 and 1916.

Correspondence.

CANKER OF THE EAR IN RABBITS.

DEAR SIR,—I hope you will allow me to add a few words to my article in your March number and to Mr. Piller's note thereon in your April issue.

First of all it must be stated that, encouraged by the interest taken in the matter, I have spent a lot of time recently in going more closely

into the matter of this ear trouble in rabbits, and I must take exception to the term " accidental parasite " in this connection. I have known of this creature, now identified as *Glycyphagus domesticus*, for years, as apparently causing a certain amount of trouble, but did not give the matter serious attention until a valuable young rabbit was on the point of dying from an ear complaint a year ago and was completely cured by Andre's liniment. Several larvæ were got out of this rabbit's ears, but no maturer forms, for the ears were dressed more than once before a search was made. As a matter of fact, our present rabbits have never been free from this parasite since they were apparently introduced in the ears of three rabbits purchased from Lady W———'s rabbitry in January, 1917. These purchased rabbits were the descendants of some animals imported from Germany in 1913. We cured, or thought we cured, the canker in 1917 ; but it has always been more or less evident in animals of other breeds which have occupied the same hutches and it has probably been the indirect cause of more than one rather mysterious death, attributed at the time to something else.

However this may be, I continue to get the parasite out of the ears of rabbits showing signs of slight canker. I have also within the last fortnight got back some rabbits bred and reared here two years ago. One of them has bad canker of the ear. The first thing got out of its ear was a large specimen of a female *Glycyphagus domesticus*, showing an egg about to be laid ; also several smaller and less mature individuals. Before the ears were attended to the rabbit was off its feed and very dull and mopish ; it has since become cheerful and hungry and altogether different. That the parasite breeds in the ear there is very little doubt, and the chain of evidence is almost complete.

Mr. Pillers and others kindly gave me the names of books dealing with Mites and I have now investigated many sources from which the creatures might have come " accidentally," without being able to reach any conclusion other than that *Glycyphagus domesticus* breeds in the rabbit's ears.

I may say that in the course of this investigation I have recently found many creatures both in rabbits' and guinea pigs' ears, which I have no reason to suppose are other than accidental and which have in some cases also been found in the hay and other food. For instance, rabbits' ears have yielded, in addition to the Mite already mentioned, an occasional *Aleurobius farinæ*, *Listrophorus gibbico* and two creatures at present unidentified ; while from guinea pigs' ears have been taken *Glycyphagus domesticus*, *Aleurobius farinæ*, *Cheyletus eruditis*, and one creature at present unidentified. Mr. Pillers has kindly seen and identified most of the above. These were all mature specimens and in no case have a series of immature forms been found such as is invariable in the case of *Glycyphagus domesticus* in the rabbit's ear.

As young rabbits of the same sex and from the same litter may be ½ lb. less in weight than healthy rabbits at 10 weeks old, if troubled with ear parasites, the economic importance of keeping them free is obvious.

C. J. Davies.

TWO NEW VETERINARY SCHOOLS.

Two fresh Veterinary Schools are about to be started in Europe, one at Zagreb (Agram) for the Yugo-Slavs, and the other at Brünn for the Czecho-Slavs.

The names of the various professors, and the actual course to be taken by the students, are not yet available.

ERRATA.

OWING to an error on the part of the printers, the name of Mr. Frank Chambers, F.R.C.V.S., Wolverhampton (late Acting Major, Royal Army Veterinary Corps) was omitted as the author of the article on page 181 of the May issue entitled "Note on the Effect of Train Journey during the Winter Months, and the Time elapsing between Detraining and Actual Embarkation, on the Prevalence of Pneumonia on Board Ship."

PUBLISHER'S NOTICE.

Owing to the recent further increase in the cost of printing and paper, we are reluctantly compelled to advance the price of the VETERINARY JOURNAL *from* 1*s.* 6*d.* *to* 2*s. per copy. The Annual Subscription will be* 21*s., post free, instead of* 18*s., and the annual combined subscription with the* VETERINARY NEWS *will be* 32*s., post free. These revised rates to take effect as from July* 1, 1920.

No increased charge will be made for subscriptions already *paid to the end of the current year.*

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